

## ABSTRACT OF THE DISCLOSURE

A two-dimensional scanner consists of a rotatable gimbal structure with vertical electrostatic comb-drive actuators and sensors. The scanner's two axes of rotation may be controlled independently by activating two sets of vertical comb-drive actuators. The first set of vertical comb-drive actuator is positioned in between a outer frame of the gimbal structure and the base, and the second set of vertical comb-drive actuator is positioned in between the inner part of the gimbal structure and the outer frame of the gimbal structure. The inner part of the gimbal structure may include a reflective surface, and the device may be used as a mirror. Furthermore, the capacitance of the vertical comb-drives may be measured to monitor the angular position of the mirror, and the capacitive position-monitoring signal may be used to implement closed-loop feedback control of the mirror angle. The two-dimensional scanner may be fabricated in a semiconductor process. Two-dimensional scanners may be used to produce fiber-optic switches.